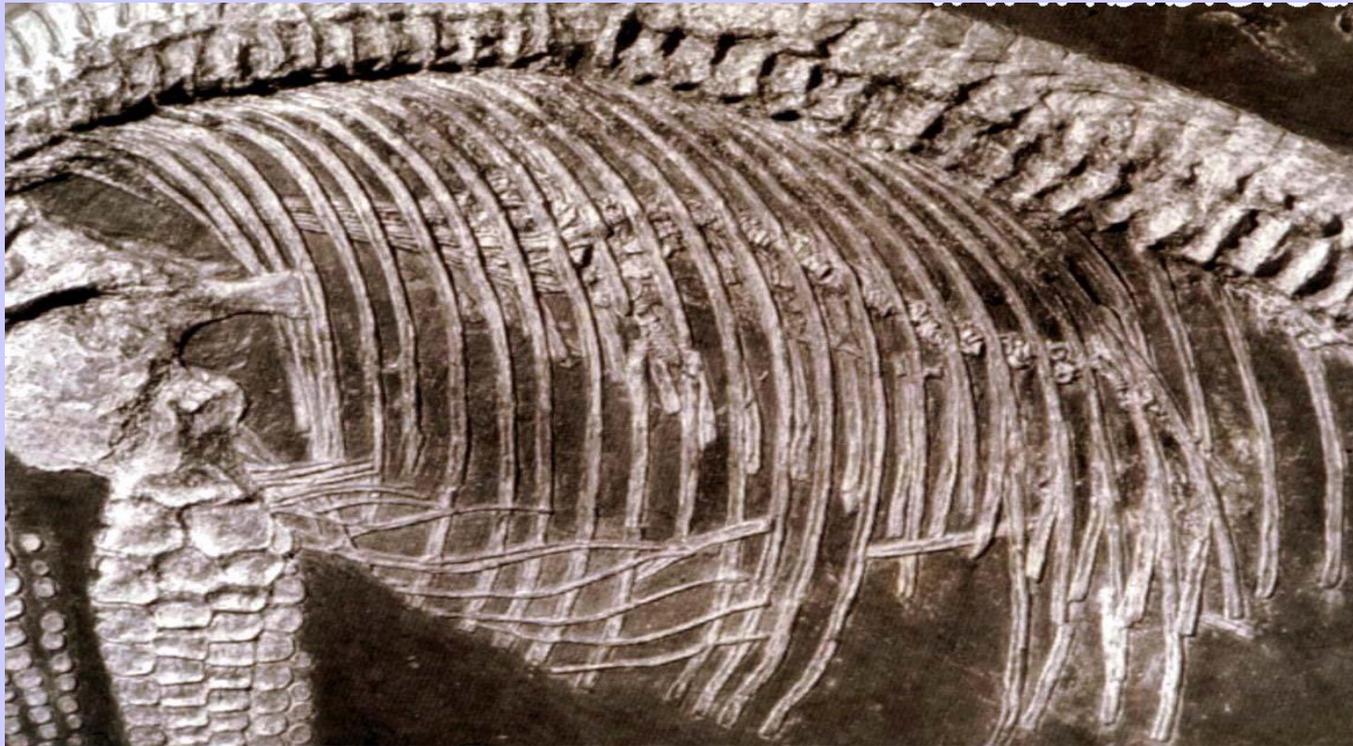


Fossils & The Geologic Time Scale



Fossils



- Preserved remains or traces of an organism that lived in the past.
- Fossils are formed when organisms die and are buried in sediment. Eventually the sediment builds up and solidifies to become sedimentary rock.

Kinds of fossils

- Petrified - when minerals replace the remains and they become rock



Kinds of fossils

- Mold - when the shell remains and the contents dissolve (hollow)



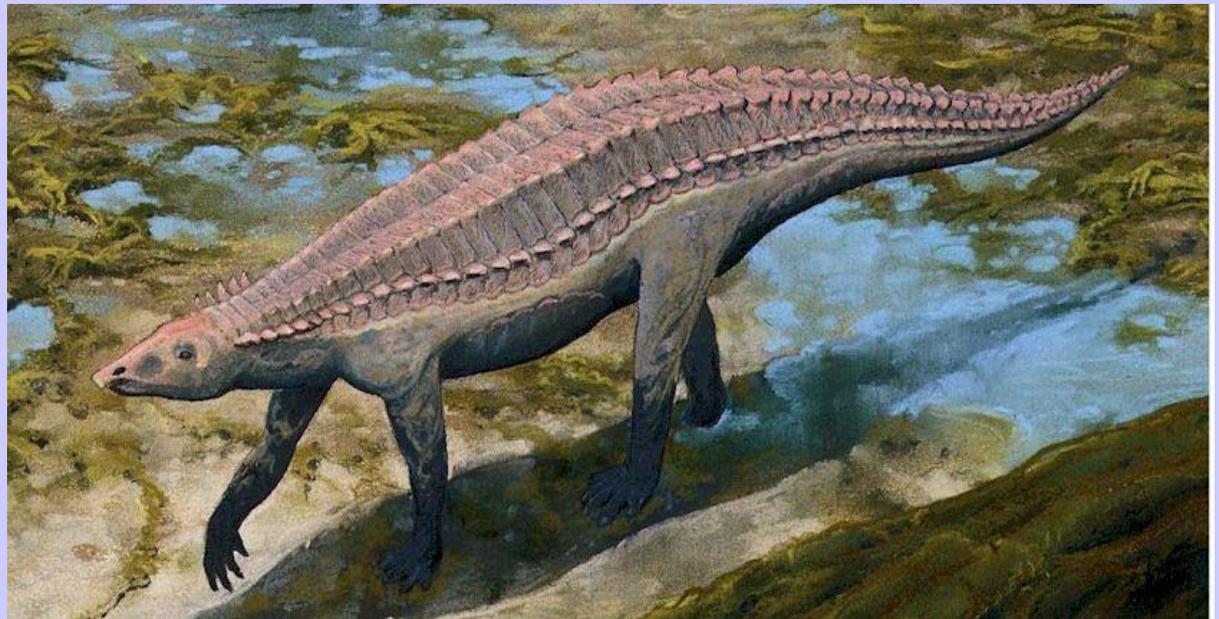
Kinds of fossils

- Cast - when the mold becomes filled with minerals that are not a part of the original organism



- Sometimes whole animals become preserved intact, but this is very rare. If an organism is surrounded by ice or tar they might be discovered looking much the same as they did when they died.

AETOSAUR
FOUND IN
THE
NATIONAL
PETRIFIED
FOREST

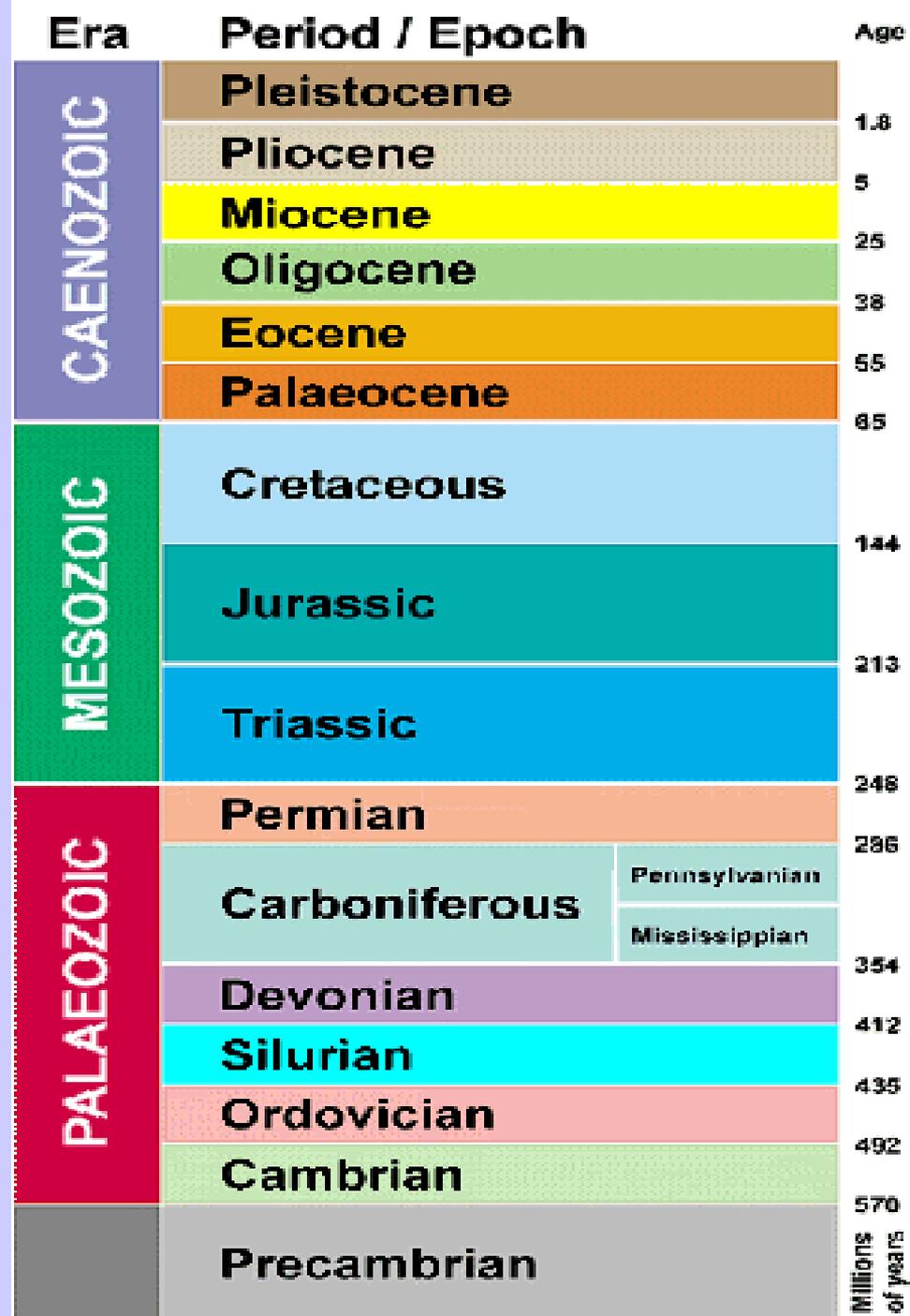


So What is the Geologic Time Scale?

- Calendar of Earth's history based on fossil evidence found in rocks and ice cores.
- This time line is separated into sections by organisms that lived during each time period.

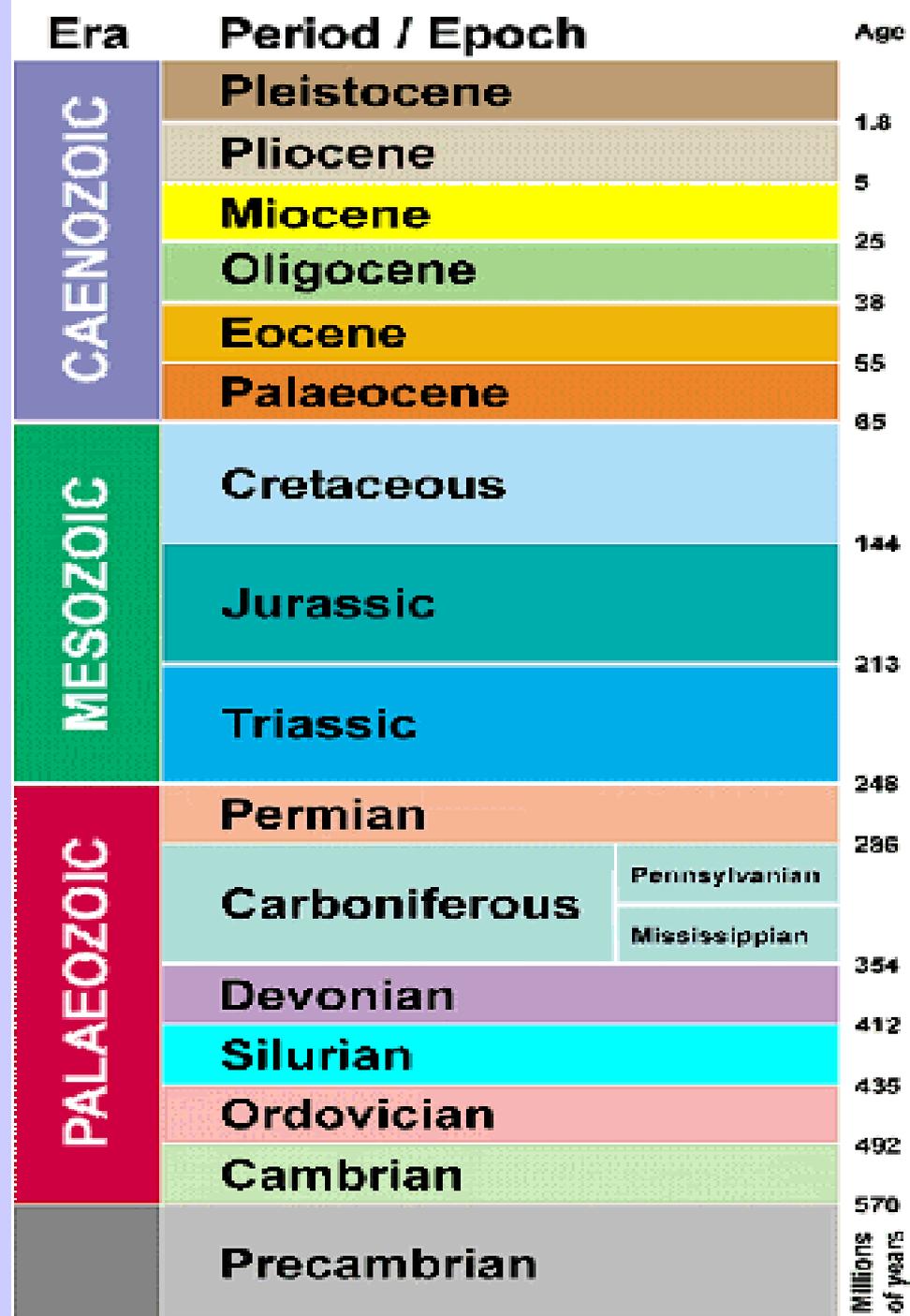
Fossil Record

- The dating of all fossils is included in the Geological Time Scale.
- This scale divides the time that the earth has existed into 4 eras.



Fossil Record

- Eras are then divided into periods based on common events in that time period.



Fossil Record

- ERAS = Longest time (millions- billions of years)
- PERIODS = (thousands – millions of years) Eras are broken down into periods.

The Geologic Time Scale

- 4 Eras
 - Pre-Cambrian
 - Paleozoic
 - Mesozoic
 - Cenozoic

The Geologic Time Scale

Pre-Cambrian (Oldest):

- Longest Era (about 4.1 billion years)
- Began with the formation of the Earth.
- The only thing that happened during this time first single celled/ multi cellular organism.

The Geologic Time Scale

Pre-Cambrian:

- This means there are no periods, because almost nothing happened during this time.

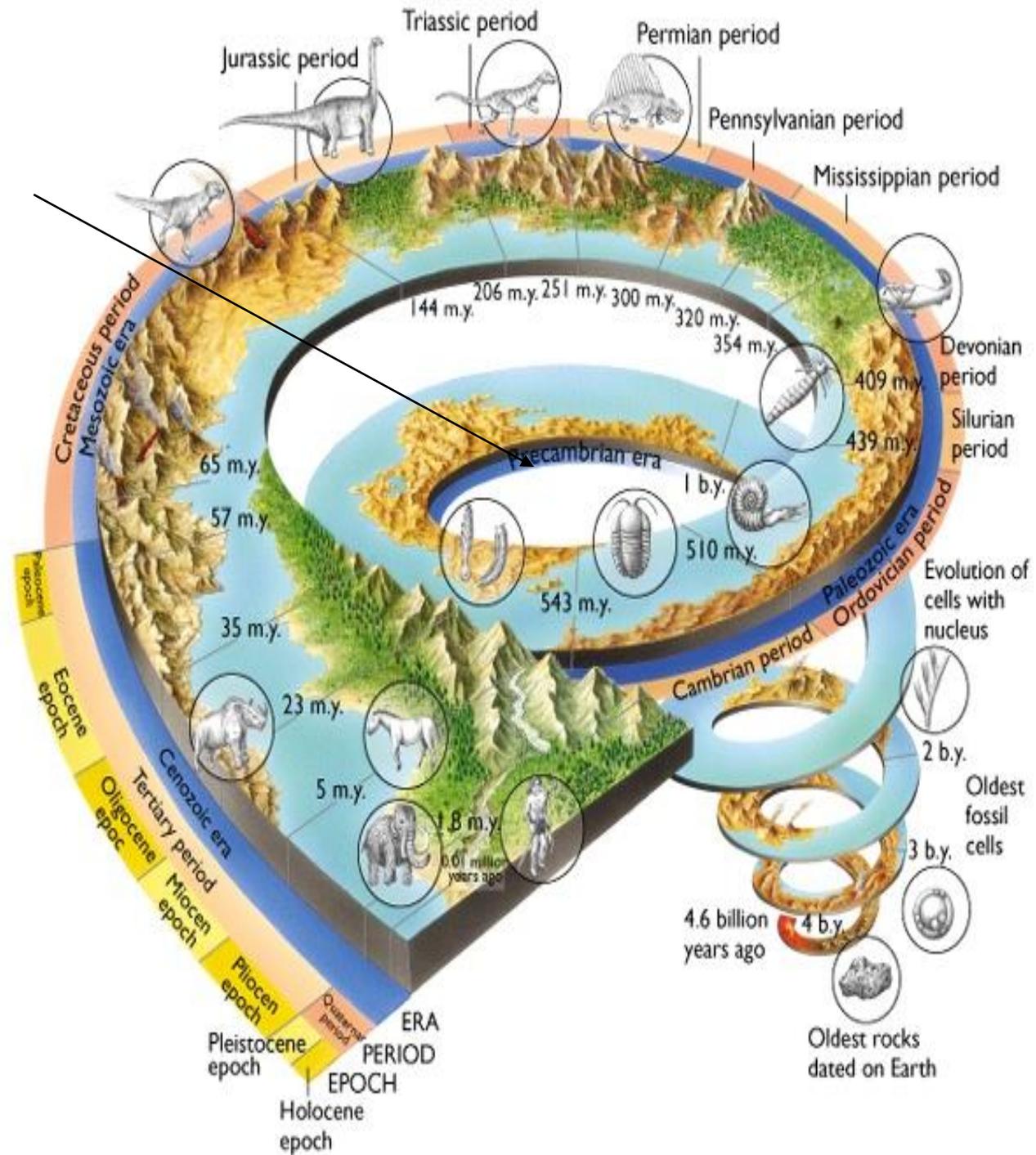
The Geologic Time Scale

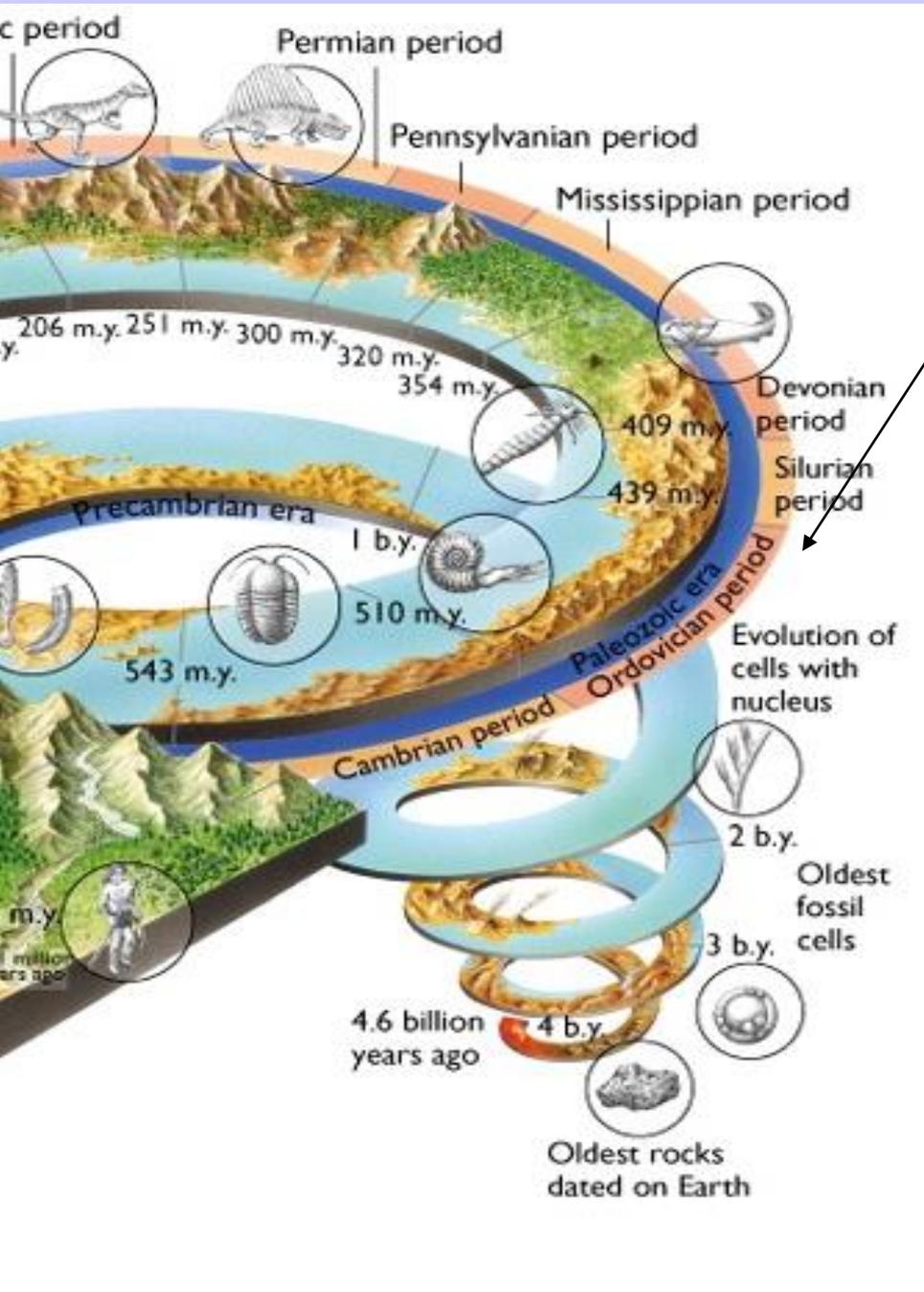
Cenozoic (Youngest):

- Most recent Era
- The end of this era is the first evidence of Humans.
- This era is still going on.

Pre-Cambrian

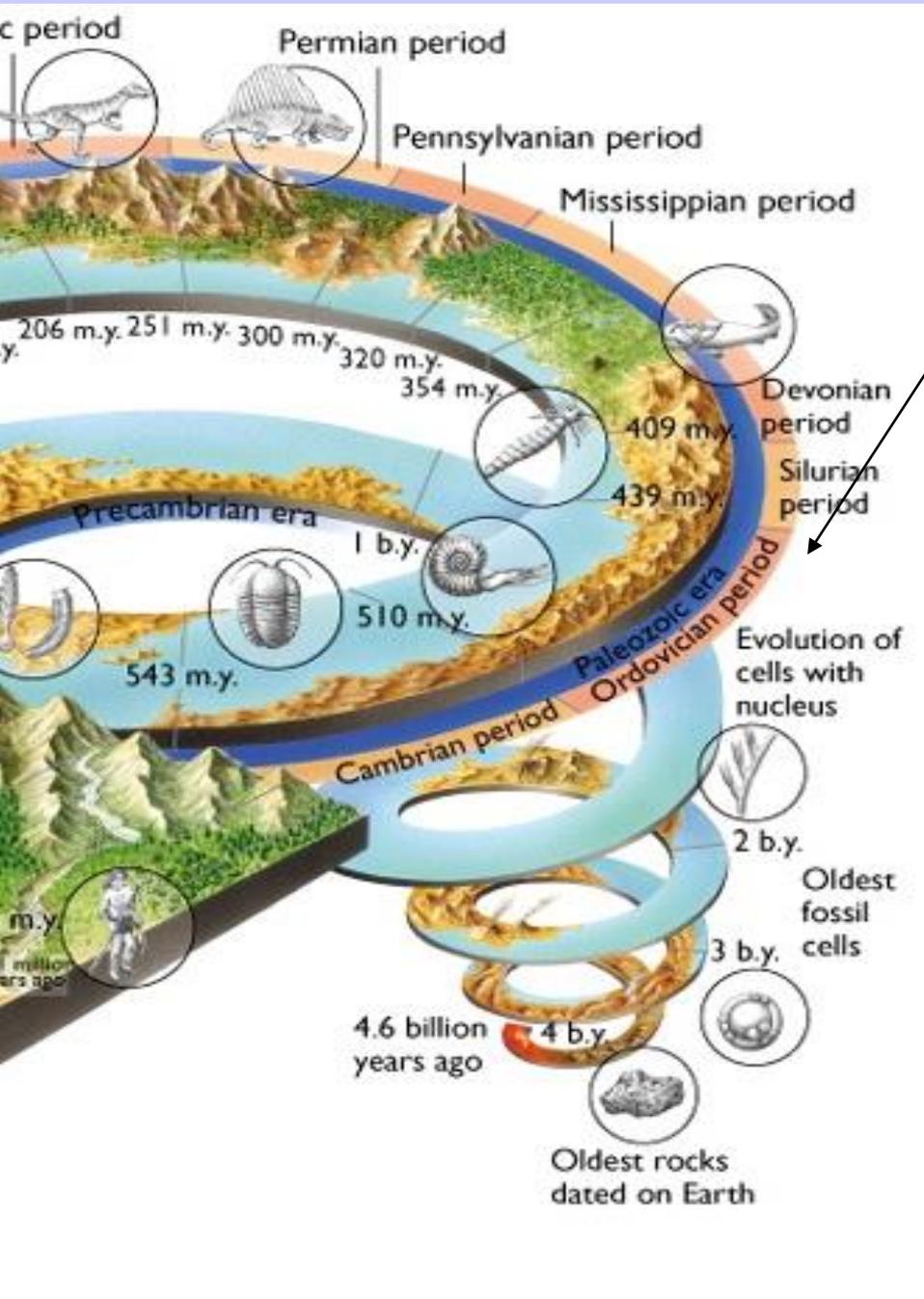
- Bacteria appeared 3.5 billion years ago, followed by algae and fungi.





Paleozoic Era

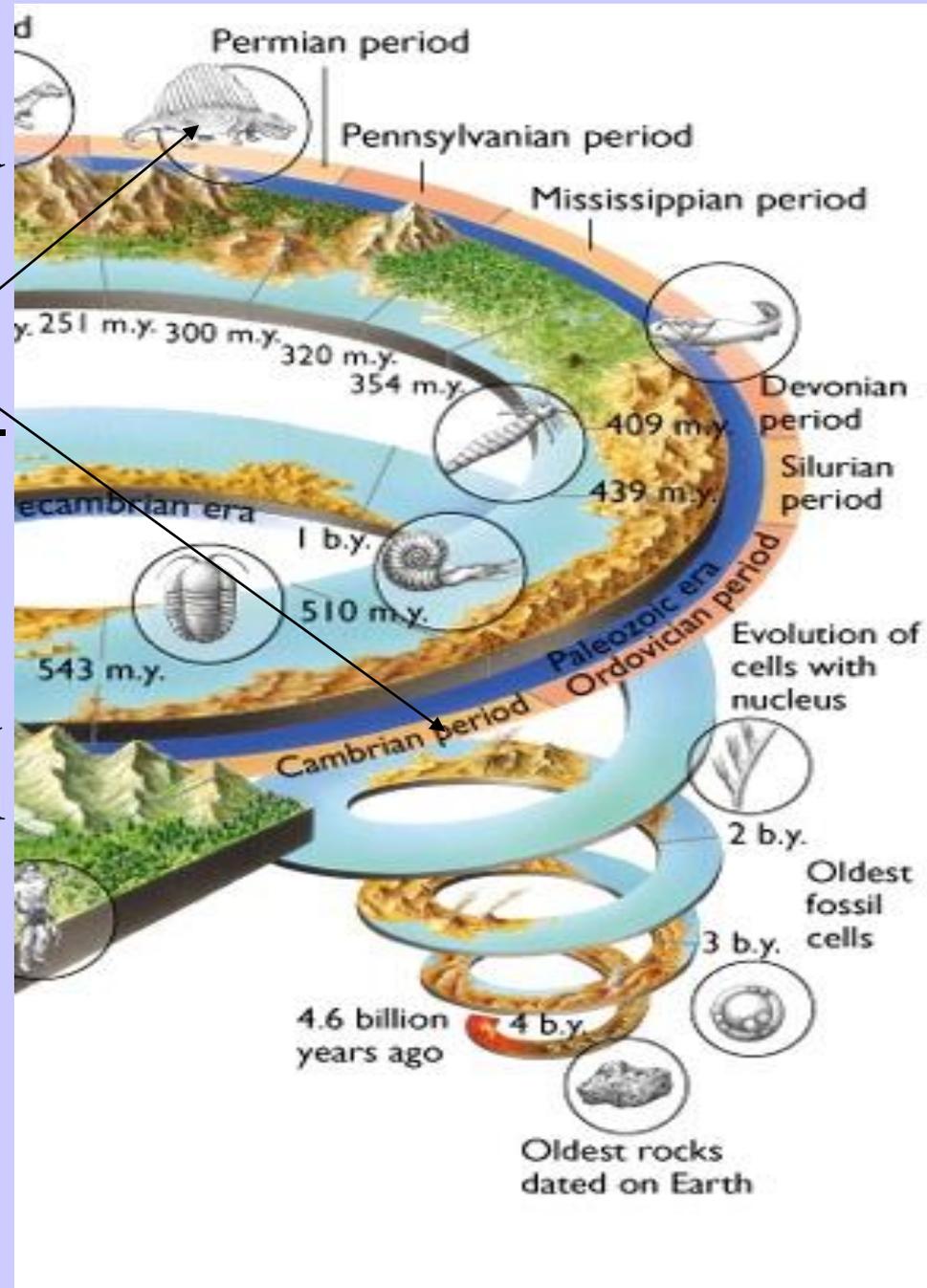
- Came after the Precambrian Era.
- Divided into 6 periods.



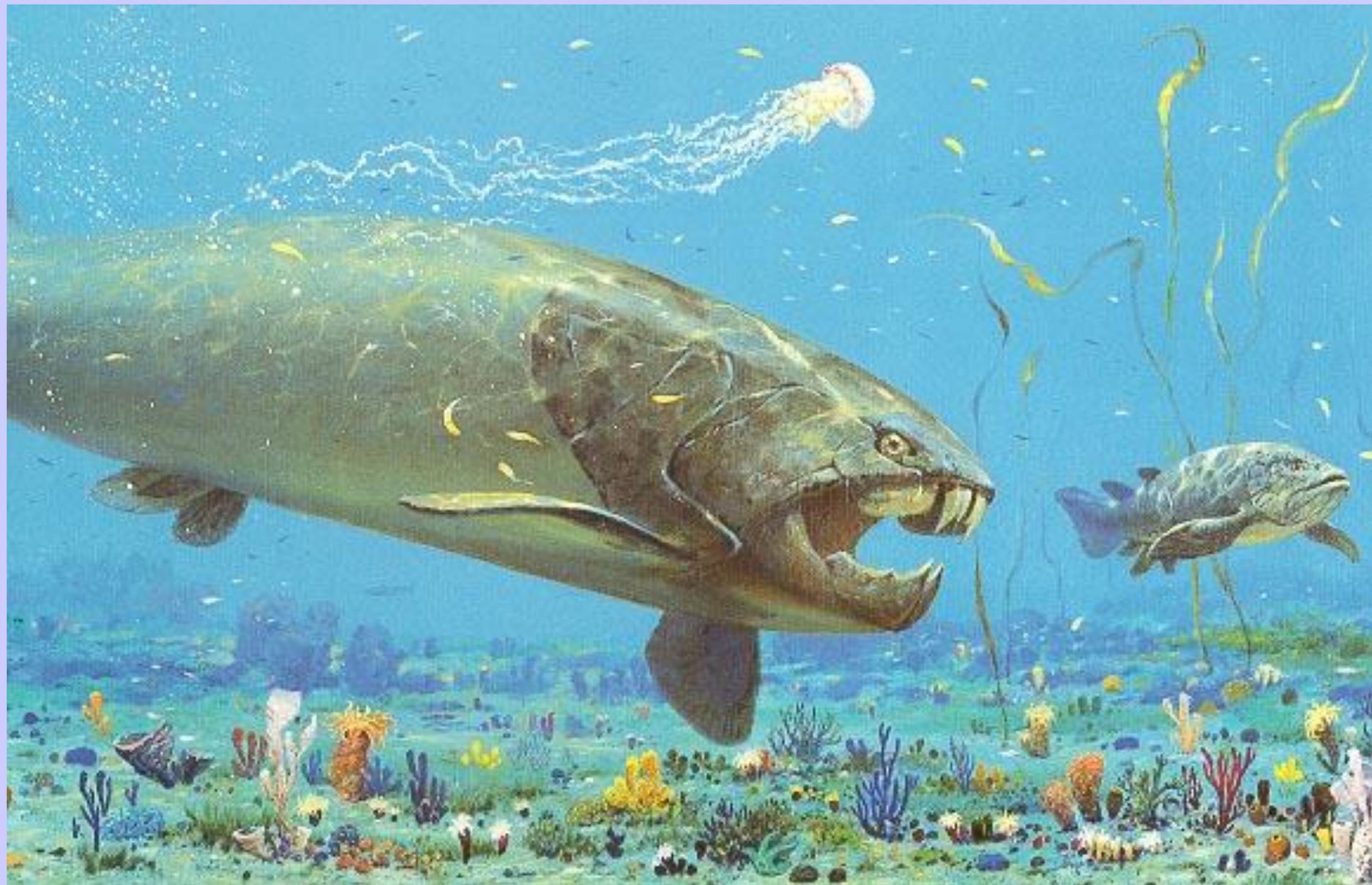
Paleozoic Era

- **Cambrian period** - Sponges, snails, clams and worms evolve
- **Ordovician period** - First fishes evolved and other species become extinct
- **Silurian period** - Land plants, insects and spiders appear

- **Devonian period** - Amphibians evolve and cone-bearing plants start to appear.
- **Carboniferous period** - Tropical forests appear and reptiles evolve.
- **Permian period** - Seed plants become common and insects and reptiles become widespread. Sea animals and some amphibians begin to disappear.

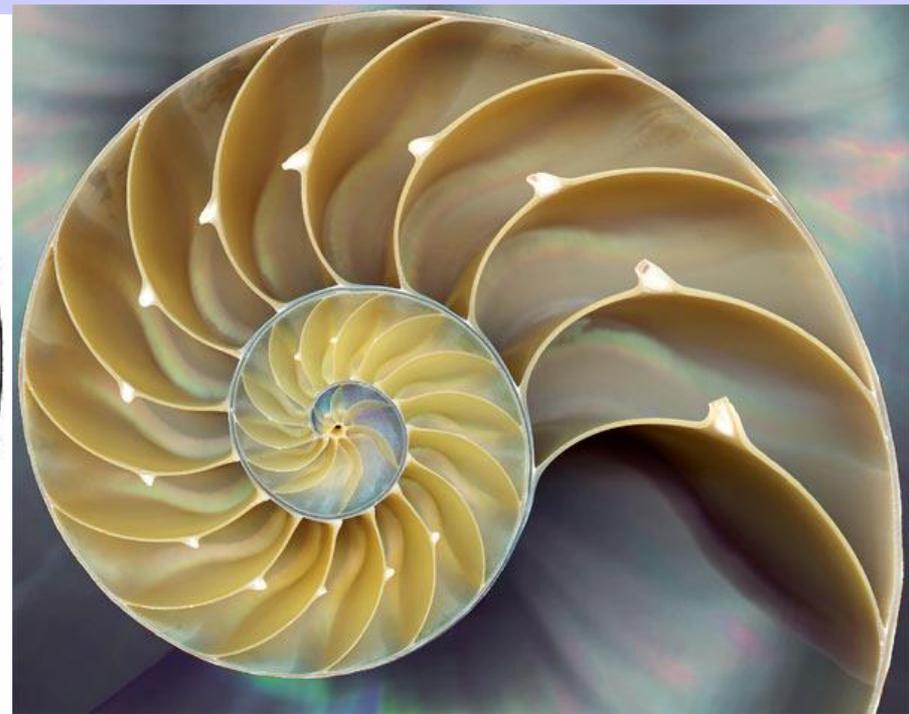
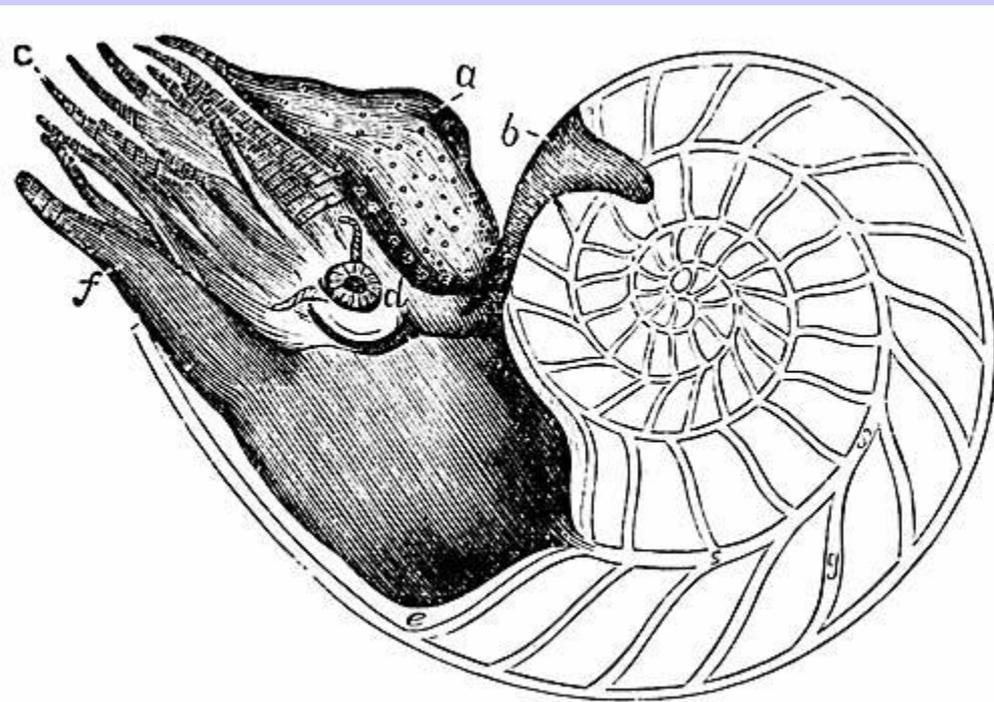


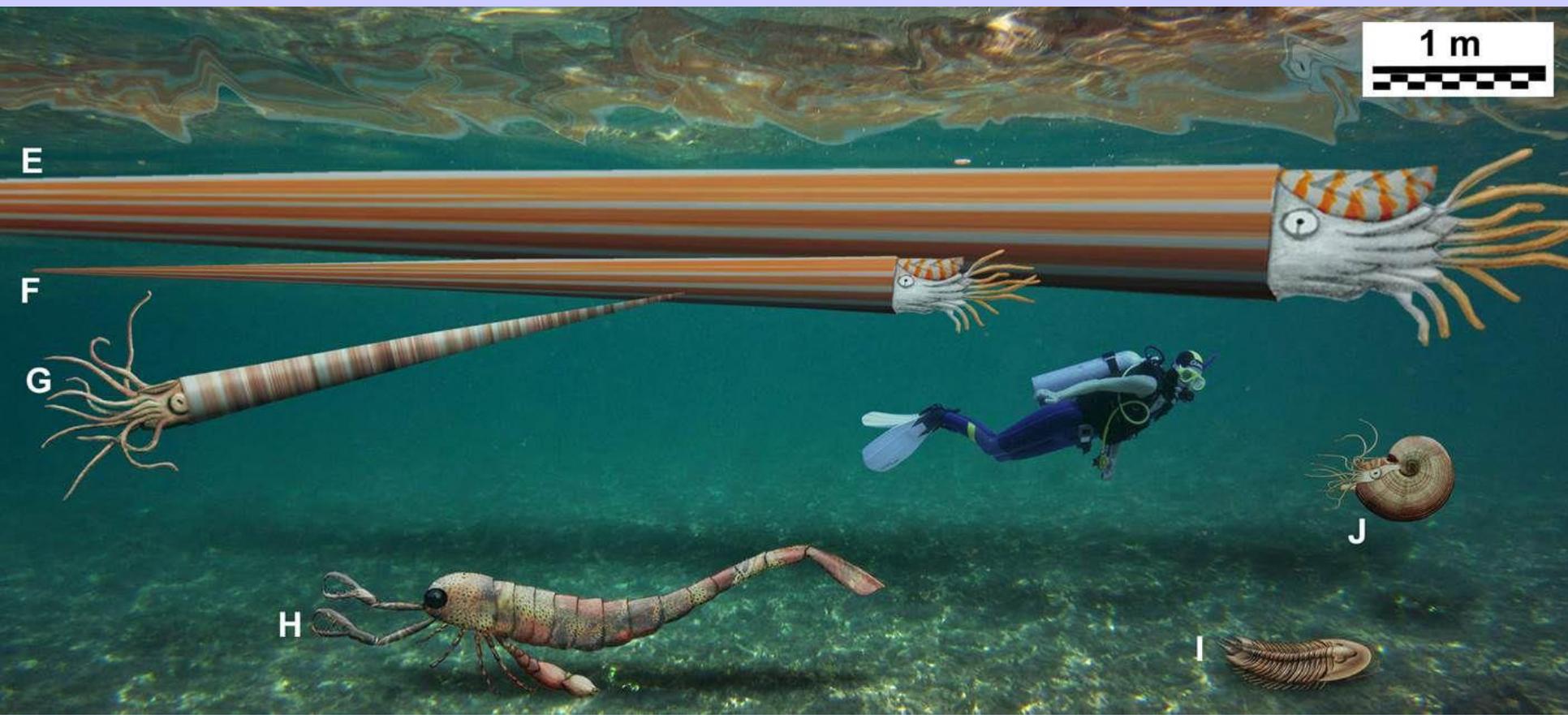












20 m

Megalodon Maximum Size

Megalodon Conservative Size

Whale Shark

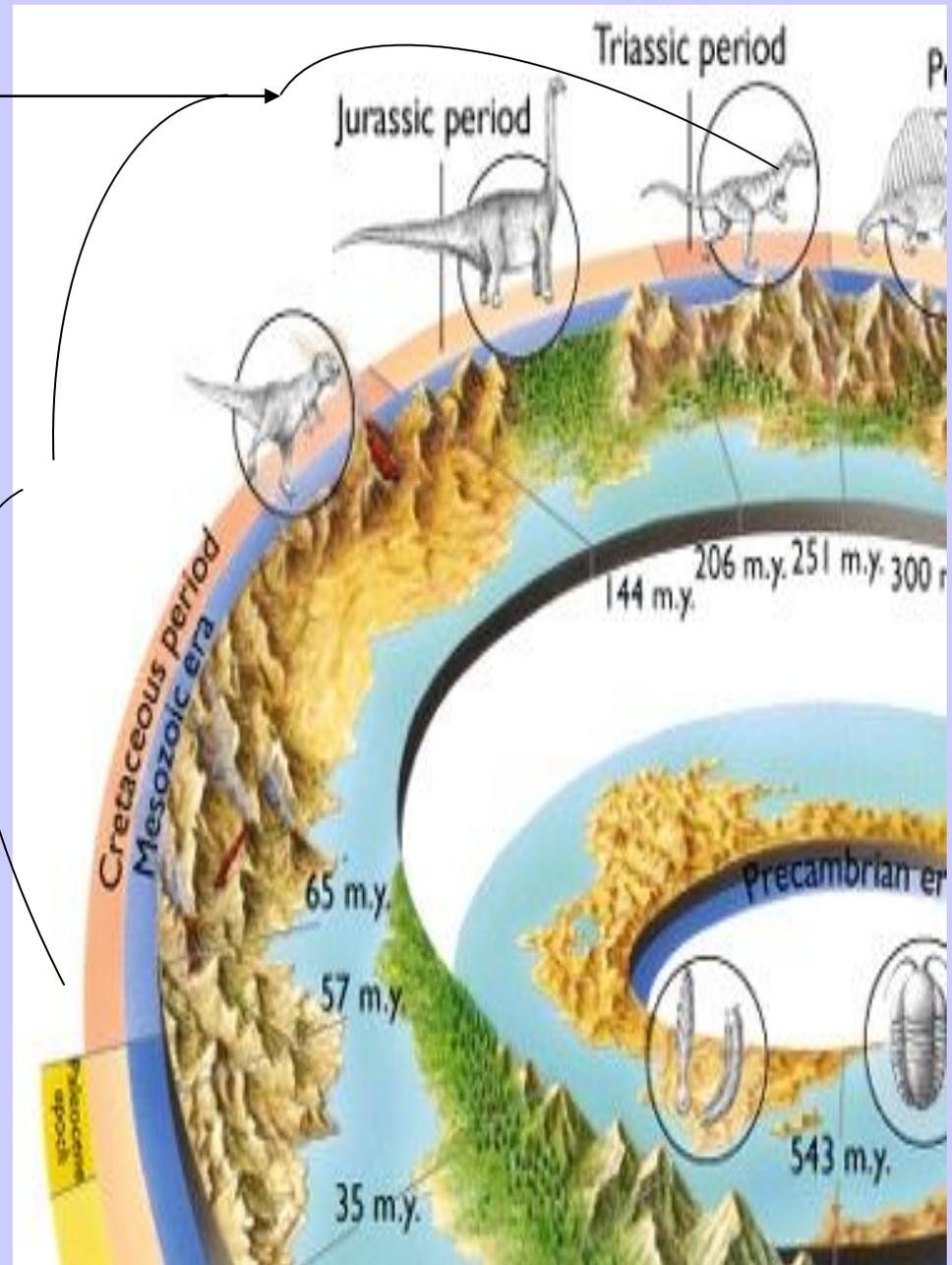
Great White Shark

You



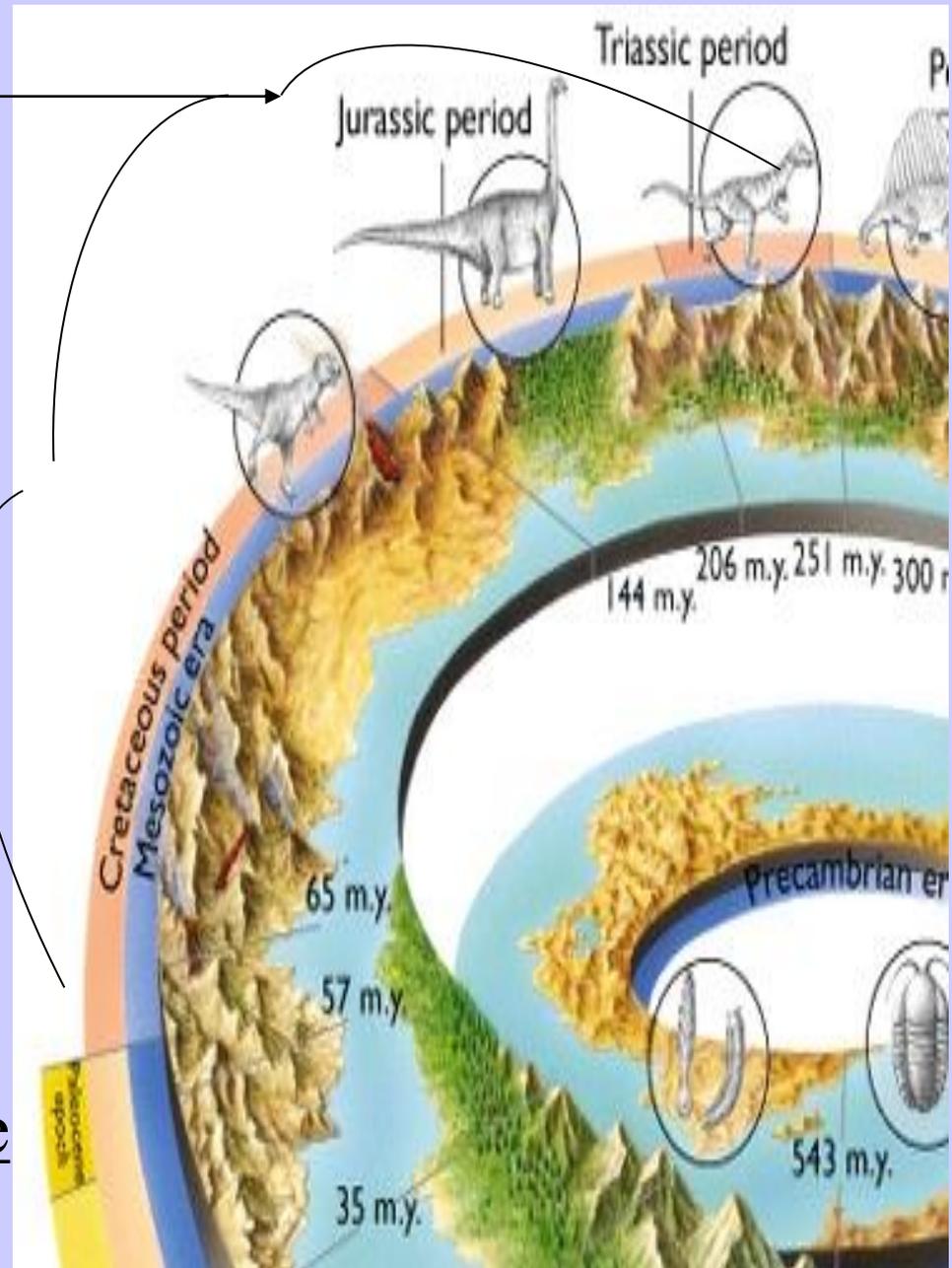
Mesozoic Era

- Comes after Paleozoic Era
- Divided into 3 periods



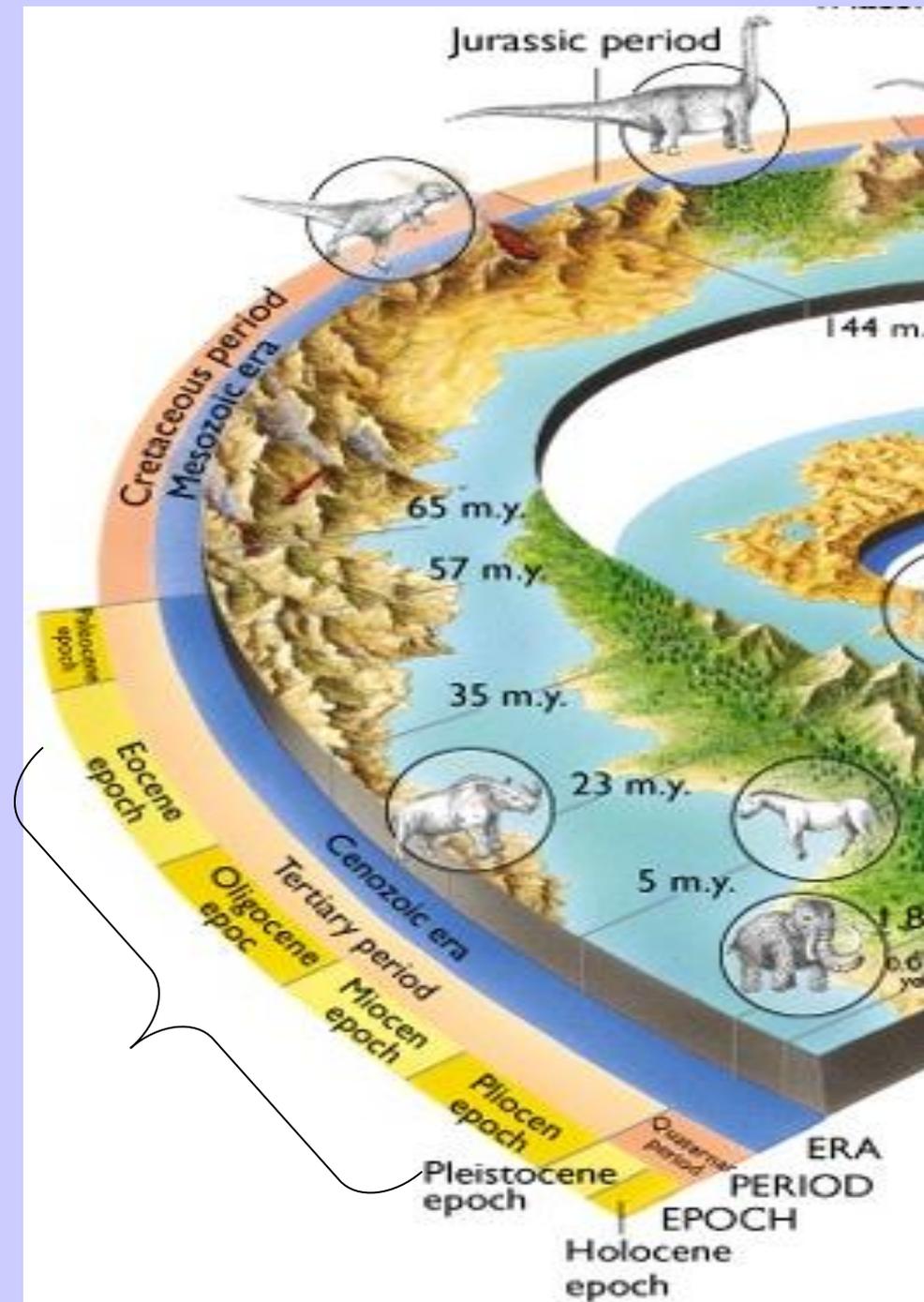
Mesozoic Era

- Triassic period - Turtles and crocodiles evolve and dinosaurs appear.
- Jurassic period - Large dinosaurs roam the world. First mammals and birds appear.
- Cretaceous period - Flowering plants appear, mammals become more common, dinosaurs become extinct.



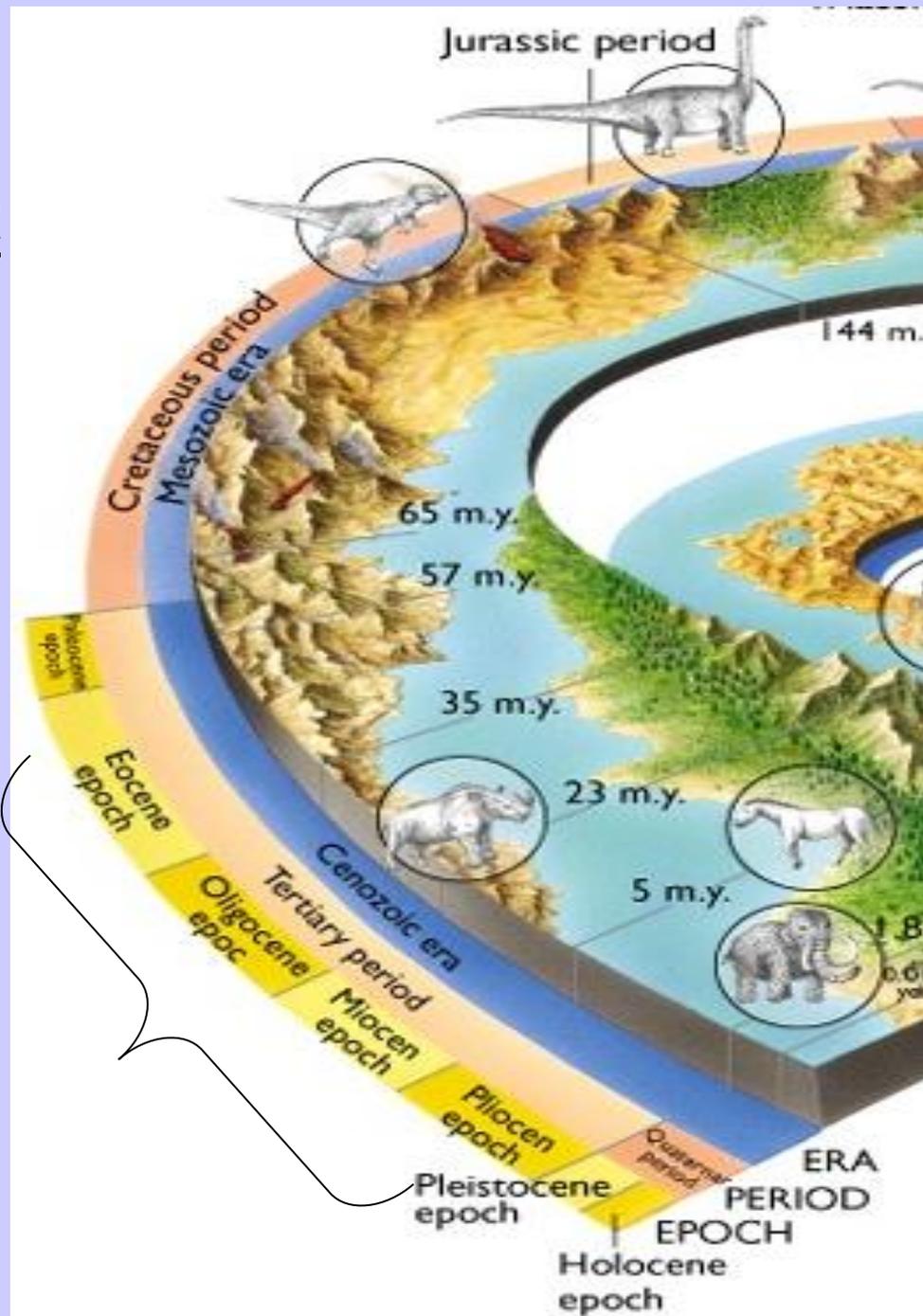
Cenozoic Era

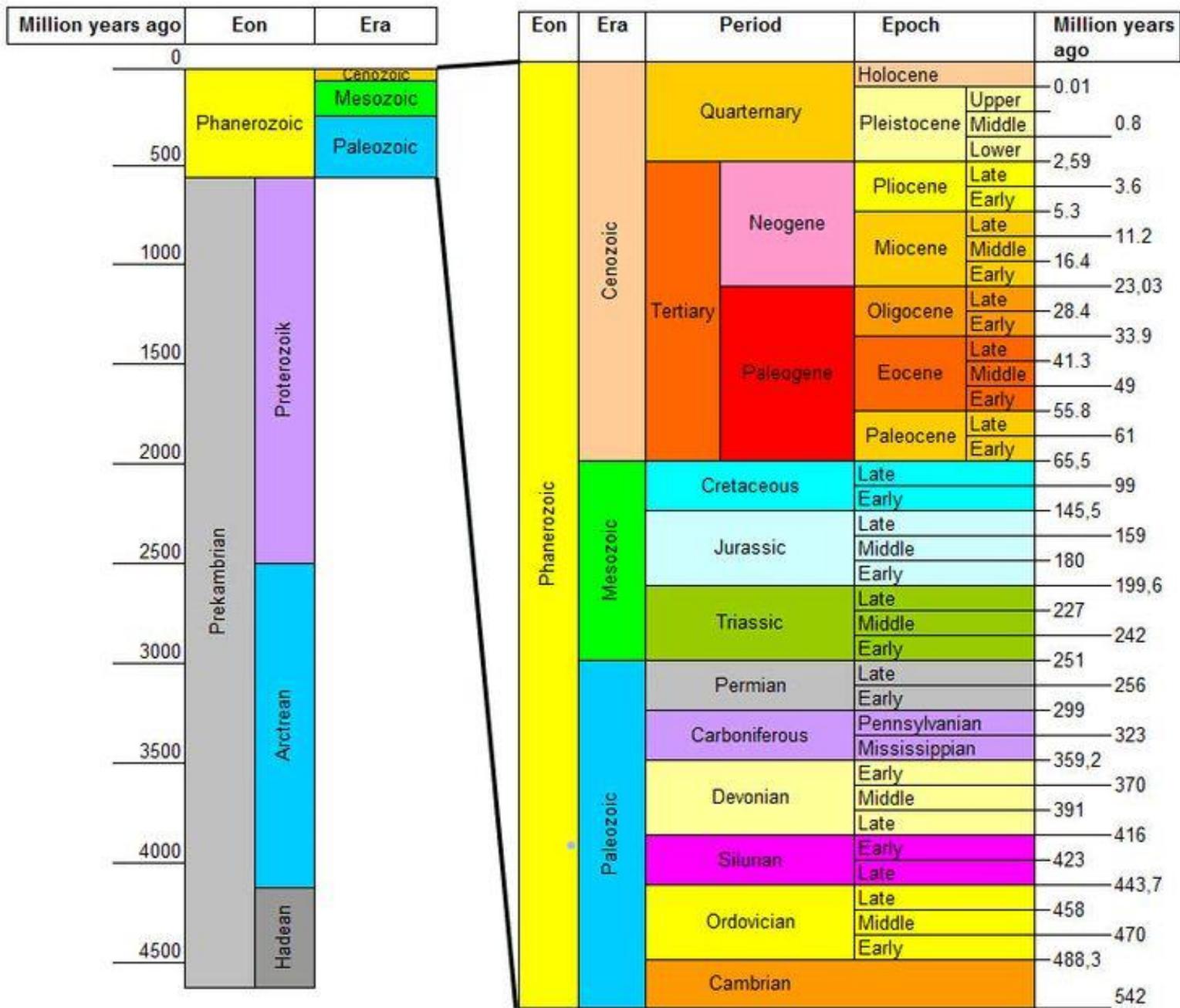
- Cenozoic means – “recent life”.
- Divided into 2 periods
- Still going on...



Cenozoic Era

- Tertiary period - First primates appear and flowering plants become the most common.
- Quaternary period - Humans evolve and large mammals like woolly mammoths become extinct.





MASS EXTINCTION

- Every Era ends in a mass extinction.
- Mass Extinction: Natural events that result in most life dying off within a small amount of time.
 - Example: Asteroid impacts

MASS EXTINCTION

- The most severe mass extinction was during the Paleozoic Era, Permian period, where 96% of all life died off.

MASS EXTINCTION

- We know this happens when we dig for fossils and find almost no fossils in the rock layers.

QUESTIONS

Practice Questions

Question 1

- Which Era do we currently live in?
 - a. Cenozoic
 - b. Mesozoic
 - c. Paleozoic
 - d. Precambrian

Question 1

- Which Era do we currently live in?
 - a. Cenozoic

Question 2

- What era on the geologic time scale lasted the longest?
- A. Cenozoic
- B. Mesozoic
- C. Paleozoic
- D. Precambrian

Question 2

- What era on the geologic time scale lasted the longest?
- D. Precambrian

Question 3

- What Era and Period did man first show up in?
- A. Precambrian, Quaternary
- B. Paleozoic, Quaternary
- C. Mesozoic, Quaternary
- D. Cenozoic, Quaternary

Question 3

- What Era and Period did man first show up in?
- D. Cenozoic, Quaternary

Question 4

- How do scientists separate each Era?
 - A. When bigger things evolved
 - B. After each mass extinction where lots of species went extinct.
 - C. Anytime a new fossil is found
 - D. Each Era is the same amount of time

Question 4

- How do scientists separate each Era?
 - B. After each mass extinction where lots of species went extinct.

Question 5

- Which Era did life, in the form of microorganisms, first appear?
 - A. Cenozoic
 - B. Tertiary
 - C. Precambrian
 - D. Paleozoic

Question 5

- Which Era did life, in the form of microorganisms, first appear?
C. Precambrian